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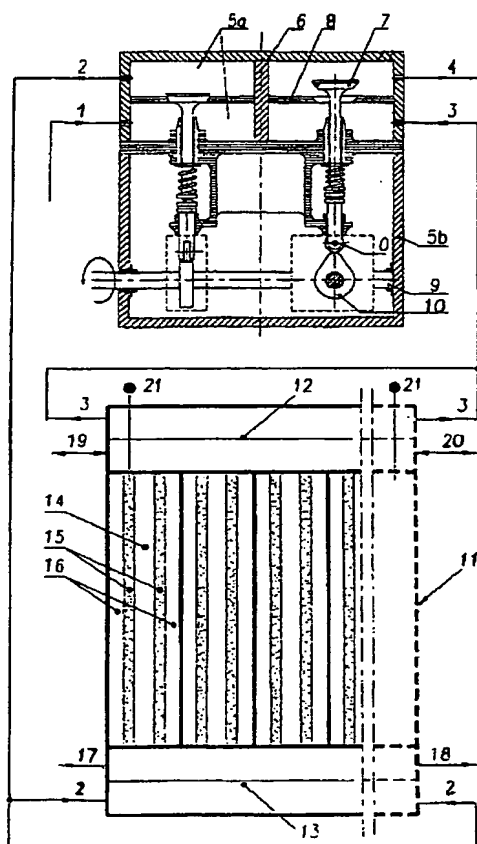
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[Continued on next page]

(54) Title: **ELECTROCHEMICAL THERMODYNAMO**



(57) Abstract: Electrochemical cells modules made up of couples of catalytic multilayer porous electrodes forming the anodes and the cathodes and delimitating external gaseous areas and internal areas containing the electrolyte wherein the pressure modulators, generating two pressure cycles independently synchronized but of opposite phase, act at the inlet and at the outlet of the electrolyte and the multilayer porous electrodes are weeping on the gas side. According to a preferred embodiment the multilayer porous electrodes are hydrophobic and conductive on the gas side, the conductive and catalytic middle layers are hydrophobic and hydrophilic, the non-conductive and non-catalytic layer on the electrolyte side is hydrophilic. Furthermore, the present invention provides the electrochemical process using the above described electrochemical cell according to which the gas is maintained at a pressure  $P$  up to 200 bar, the electrolyte pressure is varied stepwise between  $P+dP$  and  $P+dp$  by generating on the electrolyte positive pressure waves of amplitude  $dP$  and  $dp$  at the frequency  $f$ .

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